04 December 2014

Marlene H. Dortch, Secretary
Federal Communication Commission
445 12th Street, SW
Washington, D.C. 20554

RE: WT Docket No. 14-196

Dear Ms. Dortch,

This is the unified response of the United States SARSAT Program which is comprised of the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), the Department of Defense's United States Air Force (USAF), the Department of Homeland Security's United States Coast Guard (USCG), and the National Aeronautics and Space Administration's (NASA). The U.S. SARSAT program represents the United States Government as a Party within the International Cospas-Sarsat Program.

The United States Coast Guard is the SARSAT agency that has statutory authority to conduct Search and Rescue within the United States Search and Rescue Region. The Coast Guard recognizes that the Breitling "Emergency" watch offers users a unique life saving tool which utilizes the COSPAS SARSAT system. The watch being worn by the user ensures that the device is readily assessable in time of distress and the activation design make false alerts unlikely.

The U.S. SARSAT Program could support the Breitling USA, waiver request as long as the following criteria are met:

1. The U.S. SARSAT Program is concerned that the antenna configuration and wide variability of deployment orientation may not provide adequate signal for reception and detection by the Cospas-Sarsat satellites. When the vertical dipole of monopole antennas are located off ground, as they must be for this beacon, ground reflections will create destructive interference patterns in the antenna patterns, so that the resulting signal to some satellites is markedly decreased resulting in non-detection of the transmission. This effect has not been investigated for this beacon. Therefore, the U.S. SARSAT Program invites submission of test data by Breitling to demonstrate such analysis and results, including any test-coded "Emergency" watch/beacon signals that have been received and processed by the Cospas-Sarsat system.

2. The "Emergency" beacon was tested for the operating temperature range of -20° to +55°C, and complied with all Cospas-Sarsat requirements, except the minimum duration of continuous operation was 18 hours, which is less than the minimum operating lifetime of 24 hours required by Cospas-Sarsat. The de facto United States Personal Locator Beacon (PLB) standard, RTCM STANDARD 11010.2 and its predecessor 11010.1, also requires a minimum of 24 hours of continuous operation. The U.S. SARSAT Program is concerned any further reduction in the operating time may significantly decrease the likelihood of a successful rescue of the user.

This concern is compounded by the typical performance characteristics of rechargeable batteries and their diminished capacity over time. One such body investigating applications involving rechargeable batteries in permanent equipment aboard aircraft is

RTCA SC-225, convened by the FAA. However, RTCA-225 has not considered applications of rechargeable batteries for search and rescue beacons.

Therefore, the U.S. SARSAT Program invites Breitling to submit analysis and actual test results that validate battery life and accounts for impedance changes with temperature and age, the associated impact on the rate of reaction and battery life, the effect on the required recharge interval, and that the expected 18 hours of continuous operation is available over the service lifetime of the battery under the defined operating conditions of -20° to +55°C.

3. The watch is packaged with a cold weather operations warning pertaining to the 121.5 MHz homing signal temperature limitations. The watch is designed to cut power for 121.5 MHz emission if internal temperature drops below 0°C, which is of great concern to the United States Coast Guard. A clear warning stating "Search and Rescue homing and location capabilities on 121.5 MHz are unavailable when the internal temperature of the watch drops below 0 degrees Celsius" is provided to each purchaser and included in the operator's instructions.

4. Consumers are notified in writing by Breitling, USA that the device they are purchasing was granted a Cospas-Sarsat (C-S) letter of compatibility vice a Cospas-Sarsat (C-S) Type Approval. A detailed description of the difference between a C-S letter of compatibility and type approval must be clearly articulated, including the limitations of use as set forth in the Letter of Compatibility and listed here:

a. The "Emergency" with the integral antenna was tested in configuration corresponding to the PLB operating while placed above ground, which corresponds to the "Emergency" manufacturer declared intended operational scenarios. The watch shall be set for operation in such a manner that neither of the antenna sections makes contact with ground or any conductive surface, since this might affect the antenna radiation pattern.
b. The "Emergency" was not designed to operate while in water or when the watch is still worn on the wrist. The user manual clearly states that for the antenna deployment and beacon operation the watch must be taken off the wrist.
c. The "Emergency" beacon was tested for the operating temperature range of -20° to +55°C, and complied with all Cospas-Sarsat requirements, except for the minimum duration of continuous operation was 18 hours, which is less than the minimum operating lifetime of 24 hours required by Cospas-Sarsat.
d. The "Emergency" beacon provides for the operation of an integrated 121.5-MHz radio-locating transmitter only at temperatures above 0°C, whereas at temperatures below 0°C the 121.5 MHz homer is automatically disabled.
e. The "Emergency" uses a battery pack comprising one lithium-ion rechargeable battery (Li-Ion NMC/Si, Prollion INP63438) produced by Prollion, France. As indicated in the "Emergency" user manual, it is recommended that the battery charge be properly maintained by the user by recharging battery at regular intervals, not exceeding recommended time between charges of 2 months.

5. In view of the above limitations, the "Emergency" should only be operated by qualified and properly instructed customers. As indicated in the letter from the Federal Office of Civil Aviation of the Swiss Confederation (Ref. 64-13 of 5 April 2013), requesting a waiver of the non-compliances and the issuance of a Letter of Compatibility

in-lieu of a type approval certificate, Breitling will ensure that training on the product is provided to its distribution network and to future owners with the objective of ensuring that users of the product are fully aware of the design features and operational limitations.

The U.S. SARSAT Program also wishes to bring to the FCC's attention that the Radio Technical Commission for Maritime Services (RTCM) is in the process of issuing Amendment 3 to RTCM Standard 11010.2 which will require all PLBs to include a GNSS function and protocol. It does not appear from the documentation available that the Breitling Emergency 2 beacon is equipped with a GNSS function.

On behalf of the U.S. SARSAT Program,

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